The Relationship Between Neutrophil to Lymphocyte Ratio and Recurrent Aphthous Stomatitis

Nötrofil Lenfosit Oranı ile Reküren Aftöz Stomatit Arasındaki İlişki

Neutrophil to Lymphocyte Ratio and Recurrent Aphthous Stomatitis

Gül Soylu Özler, Ertap Akoğlu
Mustafa Kemal University, Department of Otorhinolaryngology, Hatay, Türkiye

Özet

Amaç: Bu çalışamnın amacı rekürren aftöz stomatitli hastalarda nötrofil lenfosit oranının artıp artmadığını araştırmaktır.Ayrıca,nötrofil lenfosit oranı ile oral ülser aktivitesi arasında korelasyon olup olamadığı araştırılmıştır. Gereç ve Yöntem: Çalışma grubunu 35 RAS'li ve 35 yaş ve cinsiyet bakımından benzer kontrol grubu oluşturdu. Hastalar ayrıntılı anamnez, genel fizik muayene sonrası laboratuar kan parametreleri açısından değerlendirildi. Bulgular: Ortalama nötrofil lenfosit oranı RAS'li grupta 2,05 ± 0,63 iken, kontrol grubunda 1,34 ± 0,48 idi. RAS' li hastaların nötrofil lenfosit oranı kontrol grubundan anlamlı düzeyde daha yüksek bulundu (p =0,0001). Ayrıca, nötrofil lenfosit oranı ile oral ülser aktivitesi arasında pozitif korelasyon saptandı (r =0,586, p=0,0001). Tartışma: Literatürde nötrofil lenfosit oranı ile RAS arasında ilişkiyi araştıran çalışma bulunmamaktadır. Nötrofil lenfosit oranı hızlı, ucuz, kolay ölçülebilen diğer akut faz proteinlerinin yerine kullanılabilecek yeni bir inflamatuar göstergedir.

Anahtar Kelimeler

Rekürren Aftöz Stomatit; İnflamasyon; Nötrofil Lenfosit Oranı

Abstract

Aim: The aim of this study is to investigate whether neutrophil to lymphocyte ratio(NLR) levels are elevated in patients with recurrent aphthous stomatitis(RAS). Moreover, we aimed to find out whether there is a correlation between NLR levels and oral ulcer activity. Material and Method: The study group consisted of 35 subjects with RAS and 35 age and sex matched control subjects. The examination of the subjects included a detailed history, general physical examination and assessment of laboratory blood parameters. Results: The mean NLR values were 2.05 ± 0.63 in RAS group and 1.34 ± 0.48 in the control group. The mean NLR values in the patients with RAS were significantly higher than the control group (p =0.0001).Moreover, there was positive correlation between NLR values and oral ulcer activity (r =0.586, p=0.0001). Discussion: There is no previous study that investigated the relationship between NLR and RAS in the literature. NLR should be taken into account as quick, cheap, easily measurable, new inflammatory marker, instead of other acute-phase proteins.

Keywords

Recurrent Aphthous Stomatitis; Inflammation; Neutrophil to Lymphocte Ratio

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Corresponding Author: Gül Soylu Özler, Mustafa Kemal University, Department of Otorhinolaryngology, Hatay, Turkey.
GSM: +905053980778 E-Mail: soylugul@yahoo.com

Introduction

Recurrent aphthous stomatitis(RAS) is seen common worldwide and may effect up to 20% of the population[1,2]. RAS is characterized by the painful recurrent round, shallow oral ulcerations of the oral mucosa.Although it is a very common condition the etiology and pathogenesis of RAS still remains unknown. The histopathological changes indicates that it is an inflammatory condition that chiefly involves the nonkeratinized mucosa [3]. Neutrophil to lymphocyte ratio (NLR) is a recently introduced marker to determine inflammation and being measured routinely in peripheral blood. In this study, we aimed to investigate the relationship between RAS and inflammation by using NLR.

Material and Method

Study population

This study population consisted of 35 patients with RAS(RAS group) and 35 age-and sex-matched control subjects(control group).The subjects attended the otorhinolaryngology rooms between May 2012 and June 2013 with a complaint of recurrent oral aphthous ulcers and between ages of 20 and 60 years were included in the study. Exclusion criterias were as follows: neoplasm within the previous two years; or other major diseases (such as heart failure, hypertension, coronary artery disease, cor pulmonale, liver or renal dysfunction, diabetes mellitus, chronic obstructive pulmonary disease(COPD), obstructive sleep apnea, connective tissue diseases, inflammatory bowel diseases), any medication(topical or systemic), pregnancy, lactation and smoking history. Demographical, clinical, and laboratory findings at admission were recorded for each subject after a standard examination including detailed medical history; general physical examination and measurement of laboratory blood parameters. The results were compared with an age- and sex-matched group.Moreover,it was investigated whether there is a correlation between oral ulcer activity and NLR levels. Ethics committee approval was obtained, and the study was conducted adhering to the Declaration of Helsinki. Informed consent was obtained from all participants.

Determination of oral ulcer activity

A composite index(CI) for determining oral ulcer activity in recurrent aphthous stomatitis were used[4].CI questionnaire was designed as three subscales with five items. The number of oral ulcers, pain status and functional disability including taste, speaking and chewing/ eating/ swallowing in the previous month was included in the index.

Scoring methods in composite index

Evaluation of oral ulcer

The number of oral ulcers was accepted as the gold standard. It was noted on a standard chart to monitor the activity of oral ulcers during the previous month by the patient. Oral ulcer activity was coded as active or inactive according to the presence or absence of oral ulcers. In this coding system, 0 point was given for the absence and 1 point for the presence of oral ulcers in the previous month. The number of oral ulcers was notedon a standard chart by the patient.

Pain status

Visual Analogue Scale(VAS) as a global and simple rating system with a 100 mm line (having extreme values in each end) is commonly used in oral medicine(4). VAS was used to label the oral ulcer related pain status during the previous month. In the past one month, how could you describe the intensity of your oral ulcer-related pain? Patients were invited to mark on the line with a distance from 0 to 100 mm. Then VAS score was categorized to calculate CI score as follows: 0–2: 0, 2.1–4: 1, 4.1–6: 3, 6.1–8: 4, 8.1 and over: 5 points.

Functional status

Patients were asked for the effects of oral ulcers on tasting, speaking and eating/chewing/swallowing status in the last month separately. How often did you feel an unpleasant taste in your mouth due to oral ulcers? How often did you have difficulty in speaking in your mouth due to oral ulcers? How often did you have difficulty in eating/chewing/swallowing in your mouth due to oral ulcers? Answers were coded by both Likert-type scale as follows: 0 (none of the time), 1 (little of the time), 2(some of the time), 3 (most of the time) and 4 (all of the time). The mean global functional status subscale score was calculated by adding up the scores of three items. Finally, CI score (0–10) was calculated by summing of subscale scores of oral ulcer activity in the previous month (0-1), oral ulcer related pain status evaluated by categorized VAS (0–5) and the mean global functional disability score evaluated by 5-point Likert-type.

Laboratory evaluation

Biochemical analysis and hemogram were evaluated using peripheral venous blood samples obtained at admission. Initially, the patients with abnormal findings in fasting glycemia, creatinine, total cholesterol, triglycerides, and thyrotropin were excluded. Blood samples were collected into tubes containing calcium EDTA. A blood cell counter (Mindray BC-6800, China) was used for measurements. All samples were run in duplicate. The NLR was calculated as the ratio of the absolute neutrophil count to the absolute lymphocyte count in peripheral blood.

Statistical Analysis

The SPSS statistical software package (SPSS, version 19.0 for Windows; SPSS Inc, Chicago, IL) was used to perform all statistical calculations. Adequacy of all parameters to normal distribution was tested by using Kolmogorov-Smirnov test. Parametric tests were applied to values with normal distribution; nonparametric tests were used in those without normal distribution.Chi-square test was used to compare the categorical parameters between the groups. Independent-samples t test was used for statistical comparison of data that match with normal distribution, and Mann-Whitney U test was applied to compare data without normal distribution between the groups. Differences were considered statistically significant at $p \leq 0.05$.

Results

Demographic Properties

The mean age of the patients with RAS and the control group was39.74 ±10.08 and 38.85±8.79 years, respectively. 62.9% of both groups were women. The groups were similar in terms of

age and sex (p = 0.706, p = 0.128).

Laboratory Evaluation

The mean NLR values were 2.05 ± 0.63 in RAS group and 1.34 ± 0.48 in the control group. The mean NLR values in the patients with RAS were significantly higher than the control group (p =0.0001; Figure 1).Moreover, there was positive correlation between NLR values and oral ulcer activity (r =0.586, p=0.0001).

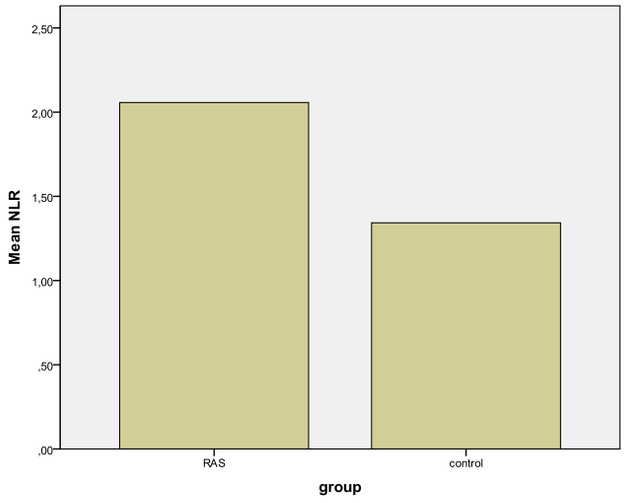

Figure 1. The mean NLR values of RAS group and control group

Discussion

Although RAS is a very common condition, the etiology and pathogenesis of oral ulcers still remains unknown.

The histopathological changes indicates that RAS is an inflammatory condition that chiefly involves the nonkeratinized mucosa[3]. In inflammatory response, concentrations of neutrophils and monocytes increase and concentrations of lymphocytes decrease in the peripheral bloodstream.

Neutrophil lymphocyte ratio (NLR) is a recently introduced marker to determine inflammation in cardiac and non-cardiac disorders [5-7]. NLR can easily be calculated by the ratio of neutrophils to lymphocytes in peripheral blood.It is a very simple and cheap method when compared with the other inflammatory cytokines including IL-6, IL-1b, and TNF-a[8].

In previous studies, increased NLR was demonstrated in cardiovascular and cerebrovascular diseases such as hypertension, unstable angina pectoris, myocardial infarction, transient ischemic attacks and stroke[9-13]. Moreover NLR has been found as a valuable index for predicting clinical outcomes in oncology[14-17] and inflammatory diseases such as Alzheimer, ulcerative colitis and appendicitis[18-20] . To our knowledge, this is the first study investigating the relationship between NLR levels and RAS.In this study we found that NLR levels in patients with RAS were higher than the control group. Moreover, there was positive correlation between NLR levels and oral ulcer activity.

Limitations of our study is the number of patients we investigated. We believe that studies with larger number of RAS patients will contribute to the literature.

Conclusion

We think that NLR should be accepted as quick, cheap, easily measurable, new inflammatory marker, instead of other acute-phase proteins.

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Competing interests

The authors declare that they have no competing interests.

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